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11 UAB "PLANNER5D"

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

UAB "PLANNER5D" dba PLANNER 5D,

Case No.

Plaintiff,

COMPLAINT FOR

1. COPYRIGHT INFRINGEMENT;
2. TRADE SECRET MISAPPROPRIATION (DTSA); &
3. TRADE SECRET MISAPPROPRIATION (CUTSA)

v.
FACEBOOK INC.,
FACEBOOK TECHNOLOGIES, LLC, THE
TRUSTEES OF PRINCETON
UNIVERSITY, DOES 1-200, ABC
CORPORATIONS 1-20, and XYZ
UNIVERSITIES 1-20.

Defendants.

DEMAND FOR JURY TRIAL

1 UAB “Planner5D” (Planner 5D) complains against Facebook, Inc., Facebook
2 Technologies, LLC (together, Facebook), and The Trustees of Princeton University
3 (Princeton or Princeton University) as follows.

INTRODUCTION

5 1. Computer vision—the ability of machines to recognize three-
6 dimensional scenes—is one of today’s leading research fields. Whoever first masters
7 this technology will forever change humankind’s relationship with machines.

8 2. Scene-recognition technology will soon enable robots to care for home-
9 bound patients, and to boost safety and productivity at offices, airports, hospitals,
10 and factories. It will also revolutionize an array of applications outside of robotics.
11 One product looks after elderly people in their homes, using computer vision to
12 detect changes in their gait or behavior, and to recognize stumbles or falls. Other
13 applications will usher in a new era in virtual reality. Virtual objects will be
14 seamlessly integrated into the user's actual indoor environment, enhancing realism
15 for both industrial and recreational applications. Shipping giant DHL has already
16 equipped its warehouse employees with "smart glasses" that use scene recognition
17 to display where each item picked from the warehouse should be placed on the
18 trolley for delivery. It's been estimated that the computer vision market will reach
19 \$48 billion by 2023, and \$60 billion by 2025.

20 3. Yet even as scientists make great strides in this burgeoning research
21 area, they have encountered a roadblock. Teaching machines to recognize three-
22 dimensional settings requires feeding them large volumes of realistic, digitized
23 renderings of such places—digitized doors, walls, furniture, and the like, arranged
24 into plausible interiors and rendered in three dimensions. Creating lifelike digital
25 scenes is extremely time- and labor-intensive. For truly realistic scenes, human
26 modelers must personally craft each three-dimensional object, and human designers
27 must arrange the objects in real-life configurations. Large collections of these kinds
28 of three-dimensional settings are thus exceedingly rare.

1 4. Yet such collections are vital to scene-recognition research. In a slide
 2 presentation posted online, a senior Princeton computer scientist asked, "What is the
 3 main roadblock for 3D scene understanding and research?" His answer: "Data!!"
 4 (See Thomas Funkhouser, *3D Data for Data-Driven Scene Understanding*, 8-9,
 5 <https://www.cs.princeton.edu/~funk/VRWorkshop.pdf> (last visited June 4, 2019).)

6 5. Planner 5D owns a collection of over a million hand-crafted, digitized,
 7 and realistic three-dimensional objects and scenes, depicting a wide variety of
 8 household and office designs. To Planner 5D's knowledge, no other collection in the
 9 world numbers even in the tens of thousands. The company created and grew its
 10 collection over many years, at a cost of millions of dollars. It began by creating
 11 several thousand hand-crafted three-dimensional objects. These were lifelike
 12 renderings of furniture, appliances, plants, people, lighting, or other objects that
 13 could occupy the interior or immediate exterior of a structure. The company then
 14 compiled a catalog of scenes made from arrangements of its individual objects. Over
 15 many years, its collection of human-created scenes grew from tens of thousands, to
 16 hundreds of thousands, to over a million.

17 6. Computer scientists at Princeton were eager to use this uniquely large,
 18 uniquely realistic collection of data. They decided to download the entirety of
 19 Planner 5D's data collection. To do so, on information and belief, they or others
 20 acting at their behest created computer code that crawled through thousands or tens
 21 of thousands of pages within Planner 5D's servers, progressively cataloging the
 22 locations of all available objects and scenes. Then they scraped this data,
 23 downloading over 2,500 of Planner 5D's objects and over 45,000 of its scenes.

24 7. In all, Princeton downloaded over five *gigabytes* of Planner 5D data. It
 25 then used this data for its scene-recognition activities. Princeton researchers
 26 published multiple articles using the data. The articles did not disguise the data's
 27 provenance: "We use a collection of 3D scene models downloaded from the
 28 Planner5D website." (E.g., Yinda Zhang, *et al*, *Physically-Based Rendering for Indoor*

1 *Scene Understanding Using Convolutional Neural Networks 3* (Proceedings of IEEE
 2 Conference on Computer Vision and Pattern Recognition, 2017)
 3 <https://arxiv.org/pdf/1612.07429v2.pdf>) (last visited June 4, 2019).)

4 8. Princeton also posted the data to a publicly-accessible Princeton URL,
 5 thereby offering Planner 5D's painstakingly developed data to anyone to download
 6 and use. Princeton labeled the stolen data the "SUNCG dataset."

7 9. Also interested in Planner 5D's objects and scenes were defendants
 8 Facebook, Inc. and its subsidiary, Facebook Technologies, LLC (together, Facebook).
 9 Facebook Technologies runs "Oculus," the well-known virtual-reality brand
 10 Facebook acquired in 2014. Scene recognition is a vital component of virtual-reality
 11 products and services. As one example, "scene fusion"—the fusing of virtual objects
 12 with the user's actual surroundings—relies critically on scene-recognition
 13 technology.

14 10. Eager to tap the enormous commercial potential of scene recognition
 15 technology, Facebook assembled its own, internal, computer-vision team. This team
 16 then enlisted broader aid in its research. With help from researchers at Princeton,
 17 Stanford, UC Berkeley, Georgia Tech, and others, Facebook launched an international
 18 scene-recognition competition called the SUMO Challenge (**Scene Understanding**
 19 and **MOdeling Challenge**). (See THE 2019 SCENE UNDERSTANDING AND MODELING
 20 CHALLENGE, <https://sumochallenge.org/> (last visited June 4, 2019).)

21 11. SUMO Challenge entrants were encouraged to submit scene-
 22 recognition papers and algorithms. Facebook promised contest winners cash prizes
 23 and a speaking slot at a "SUMO Challenge conference." This year's conference is
 24 scheduled for June in Long Beach, California. To facilitate contestants' work,
 25 Facebook and its SUMO Challenge affiliates created their own copy of the SUNCG
 26 dataset, and directed contestants to use it for their contest submissions. Facebook
 27 published a link to the copied SUNCG dataset, at a URL belonging to Stanford
 28 University—itself a SUMO Challenge participant.

1 12. In return for their chance at cash prizes and the opportunity to present
2 their winning submissions, SUMO contestants granted Facebook a “perpetual,
3 royalty-free, no-cost license and right to use and otherwise exploit” the submitted
4 materials, including Facebook’s right to use the contest submissions “in any
5 merchandising, advertising, marketing, promotion or for any other commercial or
6 non-commercial purpose.”

7 13. The gigabytes of data Princeton, Facebook, and an unknown number of
8 others have downloaded and used are the intellectual property of Planner 5D.
9 Planner 5D's data was scraped, copied, and used without its knowledge or
10 permission. Defendants' copying, use, and public disclosure and dissemination of
11 Planner 5D's core asset has caused catastrophic and potentially permanent damage
12 to the company.

JURISDICTION

14 14. This case arises under the United States Copyright Act, 17 U.S.C. §§ 101
15 *et seq.*, the Defend Trade Secrets Act (DTSA), 18 U.S.C. § 1836 *et seq.*, and the
16 California Uniform Trade Secrets Act (CUTSA), Cal. Civ. Code § 3426 *et seq.*
17 Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331
18 (copyright and DTSA claims), 1338(a) (copyright claim), 28 U.S.C. § 1836(c) (DTSA
19 claim), and 28 U.S.C. § 1367(a) (supplemental jurisdiction over CUTSA claim).

20 15. The Court has personal jurisdiction over Facebook, Inc. and Facebook
21 Technologies, LLC because each is headquartered in California.

22 16. The Court has personal jurisdiction over Princeton University because,
23 on information and belief, Princeton, together with its current and former employees
24 and students has engaged in the following acts:

- participated in and assisted with the SUMO Challenge in California, including as SUMO Challenge organizers and advisors;
- worked with Facebook and other California-based companies, individuals, and institutions involved with the SUMO Challenge;

- received “generous support”—presumably cash funding—for scene recognition work from Silicon Valley companies such as Facebook, Inc., Google LLC, and Nvidia Corporation.
- permitted the copying and storage in this district of the SUNCG dataset used in the SUMO Challenge;
- made its own copy of the SUNCG dataset generally available for download in California, an invitation that on information and belief at least some California residents accepted;
- co-authored articles with California residents about the SUNCG dataset, and specifically its origin as data downloaded from Planner 5D;
- consented to and enabled the current sabbatical here, at Google and Stanford, of Dr. Thomas Funkhouser, one of Princeton’s leading computer-vision professors. Dr. Funkhouser co-authored articles dealing with Princeton’s use of the Planner 5D data and serves as one of four members of the SUMO Challenge Advisory Board; and
- accepted Facebook’s support of another of its key scene-understanding researchers, Dr. Shuran Song, via a “Facebook Fellowship.”

19 VENUE

20 17. Venue is proper in this district under 28 U.S.C. § 1331(b), because a
21 substantial part of the events giving rise to the claim occurred here, and because all
22 defendants are subject to the Court’s personal jurisdiction here. Venue is also proper
23 under 28 U.S.C. § 1400(a), because the defendants and their agents either reside or
24 can be found in this district.

25 INTRADISTRICT ASSIGNMENT

26 18. This is an intellectual property action subject to assignment on a
27 district-wide basis. N.D. Cal. Civ. Local Rule 3-2(c).

PARTIES

19. Planner 5D is a private limited liability company organized under the laws of the Republic of Lithuania.

20. Facebook, Inc. is a Delaware corporation with headquarters in Menlo Park, California.

21. Facebook Technologies, LLC is a Delaware limited liability company headquartered in California. It is a subsidiary of Facebook, Inc.

22. The Trustees of Princeton University is a non-profit educational corporation and academic institution in New Jersey. In this complaint, "Princeton" refers to the university, its employees, agents, and others acting at its behest and direction.

23. Does 1-200 are individuals whose names and identities Planner 5D does not presently know, but who, on information and belief, committed or facilitated the copyright infringement, trade secret misappropriation, or other acts or omissions alleged here. Planner 5D will add the names and identities of these Doe defendants when it learns them.

24. ABC Corporations 1-20 are business entities or unincorporated associations, whose names, states of organization or incorporation, and entity types Planner 5D does not presently know, but which, on information and belief, committed or facilitated the copyright infringement, trade secret misappropriation, or other acts or omissions alleged here. Planner 5D will add the names and identities of these business entities or unincorporated associations when it learns them

25. XYZ Universities 1-20 are academic institutions whose identities, or whose exact role in the events alleged here, Planner 5D does not presently know. On information and belief, some of these academic institutions committed or facilitated the copyright infringement, trade secret misappropriation, or other acts or omissions

1 alleged here. Planner 5D will add the names, identities, and roles of these academic
2 institutions when it learns them.

3 26. On information and belief, in committing the acts or omissions alleged
4 in this complaint, each defendant conspired with, aided and abetted, or acted in
5 concert with each other, and each acted as the agent of each other. Under principles
6 of *respondeat superior* and like principles, employer defendants are liable for the acts
7 and omissions of their employees and agents.

GENERAL ALLEGATIONS

A. Planner 5D and Its Three-Dimensional Files

10 27. Planner 5D was founded in 2011 as a user-friendly home design tool
11 that allowed anyone to quickly and easily create their own home, office, or landscape
12 designs. Website visitors select from thousands of available objects, from structural
13 features such as windows, arches, doors, and stairs, to furniture such as sofas, beds,
14 tables, chairs, and rugs, to kitchen and bathroom appurtenances such as baths and
15 sinks, to electrical appliances such as lights, video equipment, and computers, and to
16 exterior features such as paths, lawns, trees, plants, barbeques, and swimming pools.
17 To create a design, users simply drag any of these objects onto or around a chosen
18 floor plan. Once added to a design, these objects can be quickly and easily moved,
19 rotated, tilted, re-sized, or otherwise manipulated to create the desired design. Users
20 can easily toggle between two- and three-dimensional renderings of the design. In
21 3D, a design can easily be rotated and tilted to any desired perspective.

22 28. In the years since its founding, Planner 5D has become a leader in web-
23 based interior design tools. It currently has over 40 million users worldwide.

24 29. Planner 5D created its library of realistic, digitized objects over a span
25 of more than seven years, at a cost of millions of dollars. Planner 5D continues to
26 add to this library. Currently, the library contains over 4,500 objects. Each object
27 individually, and the compilation of objects together, is an original work of
28 authorship whose copyright belongs exclusively to Planner 5D. Planner 5D also

1 owns a copyright in the data file underlying each object, and in the compilation of
 2 individual data files. All works were authored in Europe or Russia, and neither
 3 Planner 5D nor any individual object modelers are nationals, domiciliaries, or
 4 habitual residents of the U.S., or legal entities with headquarters in the U.S.

5 30. Planner 5D also owns a much larger compilation of design scenes made
 6 from arrangements of these individual objects. These scenes consist of floor plans
 7 created within the Planner 5D application using Planner 5D's objects. Planner 5D
 8 offers a wide variety of pre-existing scenes to users who might not want to start their
 9 designs from scratch. As with Planner 5D's objects, each scene in its collection was
 10 individually created by a human designer. Planner 5D's compilation of scenes (and
 11 underlying data files) now includes over 1,000,000 scenes. The copyright to this
 12 compilation belongs exclusively to Planner 5D. Further, the compilation was
 13 authored in Europe by Planner 5D, which is a Lithuanian corporation not
 14 headquartered in the U.S.

15 31. Third parties can only access Planner 5D's objects and scenes using
 16 Planner 5D's proprietary software. Users navigate to the company's website, found
 17 at <https://planner5d.com/>, and there access the Planner 5D software. The software
 18 allows users to access individual objects and scenes. But under Planner 5D's Terms
 19 of Service, users' access and use of the objects and scenes is strictly limited. No user
 20 is permitted to

21 collect, use, copy or distribute any portion of the Planner5D
 22 project or the Materials [defined as any materials found or
 23 created on the Planner 5D site]; resell, publicly perform or
 24 publicly display any portion of the Materials; modify or
 25 otherwise make any derivative uses of any portion of the
 26 Planner5D project, the Mobile applications or the Materials;
 27 use any "deep-link," "page-scrape," "robot," "spider" or other
 28 automatic device, program, algorithm or methodology which
 perform similar functions to access, acquire, copy, or monitor
 any portion of the Planner5D project; . . . download (other than
 page caching) any portion of the Planner5D project, the
 Materials or any information contained therein or use [of] the
 Planner5D project or the Materials other than for their
 intended purposes.

1 (Planner5D Terms of Service (effective April 18, 2012 through April 2018); *accord*
 2 Planner 5D Terms of Service (effective May 2018 through present).)

3 32. These terms of service and the structure of Planner 5D's website
 4 prohibit users from directly accessing, downloading, or otherwise using the data files
 5 defining Planner 5D's objects and scenes (referred to here, respectively, as "object
 6 files" and "scene files"). Instead, users drag and drop the objects as *rendered* into
 7 scenes as *rendered*. Once the rendered objects are dropped into the rendered scenes,
 8 users can resize, reposition, or reorient them. What they may never do is access, use,
 9 or download the underlying data files. Neither may they make their own copies of
 10 the three-dimensional renderings of these files, nor use the renderings other than
 11 while on Planner 5D's website designing floor plans.

12 33. In addition to the copyrights on the objects and scenes discussed above,
 13 Planner 5D's vast collection of data files for the objects and scenes are confidential
 14 and proprietary trade secrets of the company. These trade secrets, together with the
 15 company's copyrights, are the company's core assets.

16 **B. Planner 5D Evolves Into AI and Scene Recognition.**

17 34. As the importance and promise of scene-recognition technology grew
 18 in the years since Planner 5D's founding, the company's core business objective
 19 likewise evolved from providing home design tools to becoming a leader and
 20 innovator in computer scene recognition.

21 35. The market for AI-enhanced software is expected to grow to \$60 billion
 22 by 2025. One of Planner 5D's key goals has become leveraging its unparalleled
 23 repository of three-dimensional object and scene files to develop first-of-its-kind
 24 scene-recognition technology. To that end, over the past several years Planner 5D
 25 has invested significantly in developing algorithms that capitalize on Planner 5D's
 26 catalog of three-dimensional files to achieve market-leading 3D recognition.

27

28

1 **C. Defendants' Identification, Scraping, Copying, And Use of**
 2 **Planner 5D's Files**

3 **1. Princeton's Acquisition, Use, and Publication of**
 4 **Planner 5D's Object and Scene Files**

5 36. On information and belief, sometime in or before 2016, scene-
 6 recognition scientists at Princeton determined that large sets of realistic, digitized,
 7 three-dimensional scene and object data were critical to their research. In a
 8 December 30, 2016 academic paper on scene understanding, they wrote that
 9 "[i]ndoor scene understanding is central to applications such as robot navigation and
 10 human companion assistance." (Yinda Zhang *et al.*, *Physically-Based Rendering for*
 11 *Indoor Scene Understanding Using Convolutional Neural Networks*, 1 (Proceedings of
 12 IEEE Conference on Computer Vision and Pattern Recognition, 2017),
 13 <https://arxiv.org/pdf/1612.07429v2.pdf> (last visited June 4, 2019).) The Princeton
 14 scientists noted that "[o]ver the last years, data-driven deep neural networks have
 15 outperformed many traditional approaches thanks to their representation learning
 16 capabilities." (*Id.*)

17 37. Yet such successful data-driven methods had a built-in limitation:
 18 finding enough data. The Princeton researchers wrote: "One of the bottlenecks in
 19 training for better representations is the amount of available per-pixel ground truth
 20 data that is required for core scene understanding tasks." (*Id.*) As one of these
 21 authors separately wrote in a slide presentation he posted to a Princeton URL: "What
 22 is the main roadblock for 3D scene understanding and research?" "Data!!"
 23 (Funkhouser, *supra*, at 8-9.)

24 38. "To address this problem," the Princeton scientists continued in their
 25 December 2016 article, others had proposed using synthetic data. Yet no one had
 26 explained where such synthetic data could be found. In their article, the Princeton
 27 authors solved this problem. Their solution: download all required data from
 28 Planner 5D. As the authors put it: "In this work, we introduce a large-scale synthetic
 29 dataset with 400K physically-based rendered images from 45K realistic 3D indoor

1 scenes.” The data came from a “a collection of 3D scene models downloaded from
 2 the Planner 5D website.” (Zhang *et al.*, *supra*, at 1, 3.)

3 39. The Princeton authors explained that the downloaded Planner 5D
 4 dataset contained “45622 scenes with over 5000K instances of 2644 unique objects
 5 among 84 objects categories.” (*Id.* at 3.) Special surfaces provided by Planner 5D
 6 gave the objects a desirable “photo-realistic” appearance. (*Id.*) Another key feature
 7 of the Planner 5D dataset was that “indoor layouts, furniture/object alignment, and
 8 surface materials are designed by *people*.” (*Id.*) (emphasis added). Human-designed
 9 models and scenes were likely to be realistic. And realism was vital for accurate
 10 machine learning. (*Id.*) In that same 2016 article, the Princeton authors also
 11 announced they would be releasing their large trove of Planner 5D data to the public:
 12 “We will release our version of this data, together with minor improvements we
 13 have made (such as adding indoor light source labels . . .).” (*Id.*)

14 40. This Princeton then did, calling the data the “SUNCG dataset.” The
 15 dataset was posted to this Princeton URL: <http://suncg.cs.princeton.edu/> (now re-
 16 directed to Princeton’s home page). In the ensuing years, Planner 5D’s data figured
 17 prominently in the Princeton’s researchers’ work, including in further articles they
 18 published on scene recognition. (E.g., Shuran Song *et al.*, *Im2Pano3D: Extrapolating*
 19 *360° Structure and Semantics Beyond the Field of View*, 8 (Proceedings of IEEE
 20 Conference on Computer Vision and Pattern Recognition, 2018),
<https://arxiv.org/pdf/1712.04569.pdf> (last visited June 4, 2019).)

22 41. Planner 5D’s data also became featured in the work of others. (E.g.,
 23 Abhishek Das *et al.*, *Embodied Question Answering*, 4 (Computer Vision and Pattern
 24 Recognition Expo, 2018), <https://embodiedqa.org/paper.pdf>) (“We instantiate
 25 EmbodiedQA in House3D [1], a recently introduced rich, simulated environment
 26 based on 3D indoor scenes from the SUNCG dataset [8]. Concretely, SUNCG
 27 consists of synthetic 3D scenes with realistic room and furniture layouts, manually

1 designed and crowdsourced using an online interior design interface (Planner5D
2 [38]).".))

3 42. Princeton's researchers have thus exploited, and continue to exploit,
4 Planner 5D's core asset, and are doing so for the same purpose Planner 5D has set for
5 itself: developing artificial intelligence applications featuring 3D scene recognition.

6 43. On information and belief, to obtain the Planner 5D dataset, the
7 Princeton researchers or others acting on their behalf executed a detailed, multi-step,
8 systematic plan first to locate each of Planner 5D's object and scene files on
9 Planner 5D's servers in Europe, and then to scrape those files to local data storage
10 devices at Princeton. In order to locate the 2,644 objects and 45,622 scenes they
11 ultimately downloaded, the Princeton researchers (or others acting on their behalf)
12 designed and implemented computer code that would crawl page by page through
13 thousands or tens of thousands of Planner 5D web pages to identify scraping targets.
14 They then scraped each of the over 48,000 desired files from Planner 5D's servers.

15 44. Planner 5D did not become aware of any of this until 2018. But it has
16 since determined that more than 99.9% of the files in the SUNCG dataset are identical
17 copies of files from Planner 5D's collection. On information and belief, the remaining
18 .1% of the files are also downloaded Planner 5D files, but ones that have been slightly
19 altered. Some of the SUNCG files even continue to bear Planner 5D's registered
20 trademark, <PLANNER 5D>.

21 45. As noted above, Planner 5D's Terms of Service expressly prohibit use of
22 any "'page-scrape,' 'robot,' 'spider[,''] or other automatic device, program, algorithm
23 or methodology which perform[s] similar functions[,] to access, acquire, copy, or
24 monitor any portion of the Planner5D project." They likewise strictly prohibit
25 "download[ing] (other than page caching) any portion of the Planner5D project, the
26 Materials or any information contained therein or use [of] the Planner5D project or
27 the Materials other than for their intended purposes."

28

2. Facebook and the SUMO Challenge

2 46. On information and belief, Facebook, Inc. and Facebook Technologies,
3 LLC have also been acutely interested in scene-recognition technology. They have
4 created and funded their own, in-house team of scientists and engineers to research
5 and develop scene and object recognition and understanding. This research team
6 operates, on information and belief, within Facebook's "Facebook Reality Labs," a
7 major AR/VR (augmented reality / virtual reality) research center with offices across
8 the United States.

9 47. In 2018, Facebook Reality Labs launched its first Scene Understanding
10 and Modeling (SUMO) Challenge. The SUMO Challenge “targets development of
11 comprehensive 3D scene understanding and modeling algorithms.” (See Facebook
12 Research, *Facebook Reality Labs Launches the Scene Understanding and Modeling (SUMO)*
13 *Challenge*, FACEBOOK RESEARCH (June 3, 2019, 5:53 PM),
14 [https://research.fb.com/facebook-reality-lab-launches-the-scene-understanding-and-](https://research.fb.com/facebook-reality-lab-launches-the-scene-understanding-and-modeling-sumo-challenge/)
15 [modeling-sumo-challenge/](https://research.fb.com/facebook-reality-lab-launches-the-scene-understanding-and-modeling-sumo-challenge/).)

16 48. The SUMO Challenge was developed by a team of computer vision
17 researchers at Facebook, with help from researchers at Stanford, Princeton, and
18 elsewhere. (*Id.*) Current and former Stanford and Princeton researchers have also
19 served as SUMO Challenge organizers, advisors, or program committee members.

20 49. On information and belief, Facebook has supported Princeton and its
21 researchers financially. For example, Princeton’s “Vision & Robotics” Department
22 has publicly thanked Facebook (among others) for its “generous support” “for our
23 research.” And former Princeton scene-recognition Ph.D student Shuran Song has
24 been “supported by a Facebook Fellowship,” according to an article she and five
25 other Princeton scientists authored. (Shuran Song *et al.*, *Semantic Scene Completion*
26 *from a Single Depth Image* 9 (Proceedings of IEEE Conference on Computer Vision and
27 Pattern Recognition 2017), <https://arxiv.org/pdf/1611.08974v1.pdf> (last visited June 4,
28 2019).)

1 50. SUMO Challenge contestants are “evaluated on their ability to
 2 consistently infer the correct geometry, pose, appearance and semantics of the
 3 elements” of scenes supplied by the Facebook researchers. (*Id.*) Facebook promised
 4 winners cash prizes and speaking spots at the SUMO Challenge conference.

5 51. Facebook directed SUMO Challenge participants to the SUNGC dataset
 6 to develop and hone their contest submissions. On information and belief, Facebook,
 7 aided by others including Stanford and Princeton, made their own copy of the
 8 Princeton SUNCG dataset, posting it to a Stanford URL. On their SUMO Challenge
 9 web page, Facebook then posted a link to this Stanford SUNCG copy for access,
 10 downloading, and use by SUMO Challenge contestants. On information and belief,
 11 dozens of copies or more of this copy of the SUNCG dataset have been downloaded
 12 and used, by an unknown number of users.

13 52. In 2019, the Facebook defendants launched another SUMO Challenge,
 14 the 2019 SUMO Challenge.

15 53. Facebook also, on information and belief, made at least one other copy
 16 of the SUNCG dataset. It linked to this copy in another of its object-recognition
 17 projects, the “House 3D environment.” According to Facebook, House 3D “is a rich
 18 environment containing thousands of human-designed 3D scenes of visually realistic
 19 houses with fully labeled 3D objects, textures, and scene layouts.” Once again, these
 20 thousands of scenes came from Planner 5D. Facebook got them by “extract[ing]
 21 them] from the SUNCG dataset.” (*See House3D, FACEBOOK ARTIFICIAL INTELLIGENCE*
 22 (June 4, 2019, 5:56 PM), <https://ai.facebook.com/tools/house3d>.)

23 54. Like Princeton, Facebook is exploiting the Planner 5D dataset for the
 24 same purpose Planner 5D has set for itself: to train artificial intelligence applications
 25 to recognize 3D interior scenes. Worse, Facebook explicitly secured from SUMO
 26 Challenge participants the right to commercialize the fruits of their work. This
 27 strikes at the heart of Planner 5D’s business objective.

28

1 55. In March 2019, Planner 5D wrote Facebook, Princeton, and others,
2 demanding that they cease and desist infringement of Planner 5D's copyrights. Yet
3 Princeton and Facebook, on information and belief, nonetheless continue to use the
4 SUNCG dataset in their computer vision R & D efforts, and to allow or encourage
5 others' use of infringing copies of Planner 5D's copyrighted materials.

6 56. Defendants' copying, misappropriation, and especially public
7 disclosure and dissemination of Planner 5D's design files threatens to destroy the
8 market for Planner 5D's core asset. It has inflicted catastrophic and potentially
9 permanent damage on the company.

FIRST CAUSE OF ACTION
(Copyright Infringement – Against All Defendants)

13 57. Planner 5D incorporates the prior paragraphs of this complaint as
14 though fully set forth here.

15 58. Planner 5D is the sole owner of all right, title, and interest in the
16 copyrighted works whose infringement it is asserting here (the Copyrighted Works).

17 59. By, among other things, duplicating, distributing, publicly displaying,
18 and/or creating derivative works of the Copyrighted Works, the defendants, and
19 each of them, directly infringed Planner 5D's copyrights, in violation of the copyright
20 laws of the United States, including 17 U.S.C. section 101 *et seq.*

21 60. The defendants have also contributorily and/or vicariously infringed
22 Planner 5D's copyrights in the Copyrighted Works.

23 61. For example, by encouraging researchers and SUMO contestants to
24 make their own copies of, distribute, or publicly display Copyrighted Works they
25 knew to be infringing, defendants committed contributory infringement.

26 62. In addition or in the alternative, defendants vicariously infringed
27 Planner 5D's copyrights. They had the right and the ability to supervise and control
28 which models and scenes visitors to their websites were allowed to download, copy,

1 distribute, or publicly display. They selected the SUNCG dataset, a 2.5 terabyte
2 collection of Planner 5D's copyright works. And, on information and belief,
3 Facebook and Princeton financially benefitted from these activities. Facebook
4 obtained unlimited rights to commercialize, market, and use the submissions of the
5 SUMO Challenge contestants. Princeton's Computer Vision Group received
6 "generous support"—presumably cash—from Facebook and other high-tech
7 companies who benefitted from Princeton's sharing of its SUNCG dataset and its
8 work with that data. Princeton stood to attract still further sponsorship through its
9 continuing provision of resources, including the SUNCG dataset, to technology
10 companies.

11 63. On information and belief, the defendants' acts of direct, vicarious, and
12 contributory infringement were intentional, willful, and malicious, and performed
13 with knowledge that the works they or others were copying, selling, publicly
14 displaying, or creating derivative works of were copyrighted works whose copyright
15 they did not own and for which they lacked authorization to act as they acted, all in
16 reckless disregard of Planner 5D's rights.

17 64. The natural, probable, proximate, and foreseeable result of defendants'
18 copyright infringement was to cause immense damage to Planner 5D, and to secure
19 profits for themselves. And the defendants' copyright infringement in fact did cause
20 Planner 5D immense damage.

21 65. Planner 5D is entitled to disgorge defendants' profits, and to recover its
22 actual damages, all in an amount to be determined at trial. Planner 5D is also
23 entitled to a permanent injunction prohibiting continuing or future infringement of
24 its rights, and ordering destruction of all infringing copies.

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SECOND CAUSE OF ACTION
(Trade Secret Misappropriation Under the
Defend Trade Secrets Act – Against All Defendants)

3 66. Planner 5D incorporates the prior paragraphs of this complaint as
4 though fully set forth here.

5 67. The data files defining the objects created by Planner 5D, and those
6 defining Planner 5D's vast compilation of scenes (*i.e.*, Planner 5D's object and data
7 files), are trade secrets belonging to Planner 5D. Planner 5D takes reasonable
8 measures to preserve their secrecy, they are not generally known to, or readily
9 ascertainable through proper means by, the public, and they derive independent
10 economic value from not being generally known or readily ascertainable.

11 68. By, among other things, crawling through thousands of Planner 5D
12 web pages to identify each of Planner 5D's object and scene files, then scraping those
13 files from tens of thousands of further addresses on Planner 5D's servers, as well as
14 by committing the other acts and omissions described above, Princeton acquired
15 Planner 5D's trade secrets through improper means. Its acquisition, disclosure, and
16 use of the trade secrets constituted trade secret misappropriation.

17 69. By, among other things, continuing to use Planner 5D's trade secrets
18 even after Facebook and Facebook Technologies knew and had reason to know the
19 secrets had been acquired by Princeton through improper means, and/or had been
20 acquired under circumstances giving rise to Princeton's duty to maintain their
21 secrecy or limit their use, and/or had been derived from Princeton which owed
22 Planner 5D a duty to maintain the secrecy or limit the use of Planner 5D's trade
23 secrets, the Facebook defendants misappropriated Planner 5D's trade secrets.

24 70. On information and belief, the defendants' acts of trade secret
25 misappropriation were intentional, willful, and malicious, and performed with
26 knowledge that the secrets misappropriated belonged to Planner 5D and not the
27 defendants.

71. The trade secrets misappropriated here relate to a product and a service that are used in, and are intended for use in, interstate and foreign commerce.

3 72. The natural, probable, proximate, and foreseeable result of defendants'
4 trade secret misappropriations was to cause immense damage to Planner 5D, and to
5 unjustly enrich the defendants. And the misappropriations in fact did cause
6 immense damage to Planner 5D, and did unjustly enrich the defendants, all in
7 amounts to be proved at trial.

8 73. Planner 5D is entitled to recover damages for the actual loss caused by
9 defendants' misappropriation, the (non-duplicative) unjust enrichment defendants
10 received, and exemplary damages of up to twice the damages award, all as
11 determined at trial. Planner 5D is also entitled to a permanent injunction prohibiting
12 continuing or future trade secret misappropriation, destruction of all
13 misappropriated trade secrets, and attorneys' fees and costs.

THIRD CAUSE OF ACTION
(Trade Secret Misappropriation Under the
California Uniform Trade Secrets Act – Against All Defendants)

17 74. Planner 5D incorporates the prior paragraphs of this complaint as
18 though fully set forth here.

19 75. The object files created by Planner 5D, and its vast compilation of scene
20 files, are trade secrets belonging to Planner 5D. Planner 5D takes reasonable
21 measures to preserve their secrecy, they are not generally known to, or readily
22 ascertainable through proper means by, the public, and they derive independent
23 economic value from not being generally known or readily ascertainable.

24 76. By, among other things, crawling through thousands of Planner 5D
25 web pages to identify each of Planner 5D's object and scene files, then scraping those
26 files from tens of thousands of further addresses on Planner 5D's servers, as well as
27 by committing the other acts and omissions described above, Princeton acquired

1 Planner 5D's trade secrets through improper means. Its acquisition, disclosure, and
2 use of the trade secrets constituted trade secret misappropriation.

3 77. By, among other things, continuing to use Planner 5D's trade secrets
4 even after Facebook and Facebook Technologies knew and had reason to know the
5 secrets had been acquired by Princeton through improper means, and/or had been
6 acquired under circumstances giving rise to Princeton's duty to maintain their
7 secrecy or limit their use, and/or had been derived from Princeton which owed
8 Planner 5D a duty to maintain the secrecy or limit the use of Planner 5D's trade
9 secrets, the Facebook defendants misappropriated Planner 5D's trade secrets.

10 78. On information and belief, the defendants' acts of trade secret
11 misappropriation were intentional, willful, and malicious, and performed with
12 knowledge that the secrets misappropriated belonged to Planner 5D and not the
13 defendants.

14 79. The natural, probable, proximate, and foreseeable result of defendants'
15 trade secret misappropriations was to cause immense damage to Planner 5D, and to
16 unjustly enrich the defendants. And the misappropriations in fact did cause
17 immense damage to Planner 5D, and did unjustly enrich the defendants, all in
18 amounts to be proved at trial.

19 80. Planner 5D is entitled to recover damages for the actual loss caused by
20 defendants' misappropriation, the (non-duplicative) unjust enrichment defendants
21 received, and exemplary damages of up to twice the damages award, all as
22 determined at trial. Planner 5D is also entitled to a permanent injunction prohibiting
23 continuing or future trade secret misappropriation, destruction of all
24 misappropriated trade secrets, and attorneys' fees and costs.

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PRAYER FOR RELIEF

Planner 5D prays for judgment on each cause of action against the defendants, and each of them, and for the following further relief:

- a. for copyright damages, including Planner 5D's actual damages and for any (non-duplicative) profits of the defendants;
- b. for trade secret damages, including the actual loss caused by the defendants' misappropriation, plus any (non-duplicative) unjust enrichment received by the defendants, all in no event less than a reasonable royalty for the defendants' disclosure or use of Planner 5D's trade secrets;
- c. for exemplary damages of up to two times the trade secret damages awarded;
- d. for Planner 5D's reasonable attorneys' fees and costs, including a reasonable sum to cover the costs of third-party expert witnesses;
- e. for pre- and post-judgment interest on all awards for which they are available;
- f. for permanent injunctive relief prohibiting all defendants, their officers, agents, successors, and assigns, and all persons acting in concert with them, from further acts of direct or indirect copyright infringement or of trade secret misappropriation;
- g. for an order requiring the destruction of all infringing copies and all misappropriated trade secrets; and
- h. for such other relief as the Court deems just and proper.

DEMAND FOR JURY TRIAL

Planner 5D demands a jury trial on all issues qualifying for one.

RESPECTFULLY SUBMITTED,

DATED: June 5, 2019

THE BUSINESS LITIGATION GROUP, P.C.

By: /s/Marc N. Bernstein
Marc N. Bernstein

Attorneys for Plaintiff
UAB "PLANNER5D"